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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,958	12/30/2003	Valery M. Dubin	42P18397	8584

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EXAMINER	
LEADER, WILLIAM T	

ART UNIT	PAPER NUMBER
1753	

MAIL DATE	DELIVERY MODE
08/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/749,958	DUBIN ET AL.	
	Examiner	Art Unit	
	William T. Leader	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) *8-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 July 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Receipt of the papers filed on May 21, 2007, is acknowledged. In response to the office action mailed April 26, 2007, applicant elected Group I, claims 1-7 without traverse. Claims 8-35 are withdrawn from consideration.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Stonas et al (6,919,009)

4. The Stonas et al patent discloses a method of manufacturing free-standing particles wherein the particle length is from 10 nm to 50 ~~μu~~ μm and the particle width is from 5 nm to 50μm (column 3, lines 49-52). This meets the limitation of instant claim 1. The material from which the particles are made is deposited into pores by an electrochemical deposition process. See example 1, and claims 1 and 6. The particles may be made of a metal alloy (column 3, lines 54-56). This meets the limitation of instant claim 4.

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5. Claims 1, 4 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Hoppe et al (6,737,939).

6. The Hoppe et al patent discloses a method for making carbon nanotubes. In a first step, a substrate 12, such as, for example, silicon is coated with a high purity metal film, such as, for example, aluminum. The metal is anodized to produce germination points or pores in an ordered nanopore array. A small amount of catalytic materials, such as, for example, cobalt or nickel, is electrochemically deposited in the bottom of the pores to serve as a catalyst for carbon nanotube growth. See column 9, line 61 to column 10, line 5. Thus, Hoppe et al discloses the limitations of instant claim 1. Hoppe et al disclose that the catalyzing metal can be an alloy of two or more metals such as Co/Ni or Ti/Ni alloys (column 9, lines 43-44). This meets the limitations of instant claims 4 and 5.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 2 and 3are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoppe et al (6,737,939) in view of The Vossen et al text *Thin Film Processes* or Chikarmane et al (7,070,687).

10. Hoppe et al discloses that the metal particles at the bottom of the pores are deposited by electrochemical deposition broadly but does not specify the particular type of electrochemical deposition, i.e., electroless plating. Thus, Hoppe et al do not specifically disclose the limitations of claims 2 or 3. Claim 2 differs from Hoppe et al by reciting that the electrochemical process comprises an oxidation-reduction reaction, while claim 3 differs by reciting that the ionic precursor is reduced by a chemical reaction.

11. The Vossen et al text discloses that electroless plating is an electrochemical deposition process in which deposition of a metallic coating takes place by a chemical reduction. A chemical reducing agent provides electrons for the reduction of metal ions in the plating solution and is, therefor, itself oxidized. Electroless plating possesses several desirable characteristics such as essentially perfect throwing power. See pages 212-213.

12. The Chikarmane et al patent discloses a process for depositing metal into trenches and vias to form interconnections in the manufacture of integrated circuits. The metal may be deposited by the electrochemical deposition processes of electroplating or electroless plating. See column 1, lines 9-12. Electroless plating involves the deposition of metal ions from an

electrolyte solution by chemical reduction. See column 6, lines 55-56. As shown by the equation at column 6, lines 61-64, the deposition comprises an oxidation-reduction reaction.

13. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have utilized electroless plating as the electrochemical deposition process of Hoppe because it is a recognized electrochemical deposition process with advantageous properties such as perfect throwing power as taught by Vossen et al, and is suitable for depositing metal into extremely small openings as shown by Chikarmane et al.

14. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoppe et al (6,737,939) in view of Lee et al (6,755,956).

15. As noted above, Hoppe et al discloses the deposition of catalytic alloys. Claims 6 and 7 differ by reciting the deposition of an alloy of a Group VI metal, and an alloy of a group VIII and a group VI metal.

16. The Lee et al patent is directed to catalyst-induced growth of carbon nanotubes. The catalyst may be a metal or combination of metals including nickel and cobalt (group VIII metals) and molybdenum (a Group VI metal). See column 1, lines 46-54. It would have been obvious at the time the invention was made to have utilized an alloy of a Group VIII and a Group VI metal as the Group VIII metal alloy in the process of Hoppe et al because Lee discloses that nickel, cobalt and molybdenum are suitable metals for forming catalytic alloys for the formation of carbon nanotubes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

WL
William Leader
August 3, 2007

Susy Tsang Foster
SUSY TSANG-FOSTER
PRIMARY EXAMINER